ALLATOSTATINS AS NEUROPEPTIDE REGULATORS OF JUVENILE HORMONE PRODUCTION

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The allatostatins are a large family of neuropeptides originally isolated from the cockroach, *Diploptera punctata* on the basis of their ability to inhibit juvenile hormone biosynthesis. Additional allatostatins have subsequently been isolated from several other species of cockroach including *Periplaneta americana* and *Blatta orientalis*, as well as from the blowfly, *Calliphora vomitoria* and the locust, *Schistocerca gregaria* and allatostatin-like immunoreactivity has been reported in other Arthropods as well as in helminths. The allatostatins are characterized by the common carboxyl terminus Tyr/Phe-X-Phe-Gly-Leu-amide, where X=Ser, Gly, Ala, Asp or Asn, and this pentapeptide appears to be the critical core sequence for biological activity. Variations in the amino-terminal address region result in large differences in potency of the allatostatins, although efficacy for all allatostatins is similar. To date, over fourty different allatostatins have been isolated or identified

Using cDNA, the coding region of the gene for allatostatins has been characterized and sequenced in *D. punctata* and *P. americana*. Allatostatins are produced in brain and ganglia and *in situ* hybridization has demonstrated allatostatin-expressing cells in brain and in midgut. Expression studies using slot-blots have revealed that allatostatin message occurs in brain, ganglia and gut. Levels of expression change during development and during the reproductive cycle and can be modulated by treatment with a JH analogue.

In addition to their ability to inhibit JH production, allatostatins are also modulate myotropic activity of gut, and on the basis of their extensive distribution in the CNS, they also appear to act as neuromodulators. Receptors for allatostatins have been identified and partially characterized from both brain and gut membrane preparations.

The allatostatins are an ubiquitous and multifunctional family of peptides in invertebrates and show no sequence similarity to any vertebrate peptides. Nonetheless, they show some similarity in function and distribution to the vertebrate peptide somatostatin.

Source: https://www.industrydocuments.ucsf.edu/docs/rpcb0000